REMARKS

The claims in the application have all been rejected by the Examiner as being obvious over a combination of the teachings of the Futawatari ' 289 and Fischer '879 patents.

There are two independent claims in this case, namely, system claim 1 and method claim 23. Applicants' remarks below are directed to those two independent claims. Applicants believe that the dependent claims are allowable for the same reasons that make the independent claims patentable.

Claim 1 of the present invention recites: "...a first microprocessor... to drive one side of a load...[and]...a second microprocessor...to drive the other side of the load...[and]...arranged so that when either microprocessor detects a fault...the load is switched off". Claim 23 has equivalent language.

The Examiner has accepted that Applicants' claims 1 and 8 are not anticipated by Futawatari owing to the presence of two microprocessors, both able to provide a fail-safe input. Applicants' would note that claims 1 and 23 are further distinguished over Futawatari in that there is no disclosure of the first microprocessor driving <u>one side</u> of the load and any element - let alone the second microprocessor - driving <u>the other side</u>.

The "sides" of the load can be understood with reference to the circuit shown in Fig. 1 wherein there is shown a high side (the supply-side) driven by driver 12 and a low side (the ground-side) driven by driver 14.

In contrast, referring to Fig. 1, Futawatari discloses an actuator d (driver) for controlling a plurality of engaging elements e (load). Actuator d (driver) accepts two inputs: a primary input (elements a, b and c) and a secondary fail-safe input (elements g, j, i and k). Although the actuator d (driver) accepts two inputs, Futawatari does not disclose driving the engaging elements e (load) on one side using a first input and on a second side using a second input.

Futawatari provides two inputs to the actuator d (driver): a primary input (from units a, b, c - column 12, line 56 to column 13, line 1) and a fail-safe input from units g, i, j, k - column 13, lines 10 to 33. The primary input is overridden by the safety input if element k of the fail-safe input detects a fault. Since Futawatari has only one input node, the system must determine which input takes preference: this is handled by element k. Thus, the fail-safe system depends crucially on the element k to determine when there is a fault and to switch between input circuits.

In contrast, Applicants' invention provides a high side and a low side driver (voltage) input which can be controlled independently and either can be operated in a fail-safe mode if a fault is detected. The claimed invention does not crucially depend on the ability to switch between two input circuits. A fault with the switching means of Futawatari would render the system unprotected regardless of how many fail-safe inputs feed the input node. The claimed invention provides an improved fail-safe system by virtue of driving different sides of the load with the different inputs thereby negating the need for switching means.

Thus, the claimed invention provides more than mere redundancy. It provides an independent back-up. Crucially, the claimed invention does not rely on a means for switching between inputs in the event of a fault.

Fischer adds nothing further to Futawatari. Fisher recites (Fig. 7, column 7, lines 28 to 39) that higher harmonic control (HHC) is distributed between a scheduled system MFCS and an active HHC controller which can update scheduled HHC commands via a cross channel date link. There is no disclosure in Fischer of respective microprocessors driving respective sides of a load, nor of switching the load off if either detects a fault in the control of the load. Fischer does disclose: "…a dual (fail-safe) function …" (column 7, lines 34-35). But it will be seen that this simply refers to the possibility of adding active HHC commands to the scheduled HHC commands. Thus, Fischer does not bring the skilled artisan any closer to the claimed invention than Futawatari because there is nothing in the document which would lead the skilled reader to consider using two inputs to drive different (voltage) sides of the load. In fact, the skilled reader would not consider consulting the documents as they relate to different, highly specialized fields and very specific aspects of operation within those respective fields such that compatibility would be expected even if the skilled reader were to recognize from Futawatari that an additional microprocessor would be required. There is no suggestion of providing such a microprocessor driving the other side of the load in Fischer, let alone that the load would be switched off if either microprocessor detected a fault in the control of the load. In fact, even if the documents were combined, the result would be a redundancy system as in Fischer whereby actively determined commands would be added to scheduled

commands; any additional fail-safe inputs would be wired in parallel with the existing inputs thereby merely providing redundancy. All inputs would be equally reliant on a switching element to switch between the inputs in the event of a fault so as not to interfere with normal operation.

There is no teaching in Futawatari of applying the fail-safe input to the other side of the load. In fact, Futawatari and Fischer both teach adding fail-safe inputs in parallel with the primary input. Thus, the claimed invention is not obvious in light of the cited art.

The dependent claims contain all of the limitations of the independent claims 1 and 23 and thus are allowable for the same reasons that makes those two claims allowable.

Accordingly, Applicants request further and favorable action.

Respectfully submitted,

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